

The Knowledge Bank at The Ohio State University
Ohio State Engineer

Title: Engineering Review

Issue Date: Nov-1933

Publisher: Ohio State University, College of Engineering

Citation: Ohio State Engineer, vol. 17, no. 2 (November, 1933), 10-11.

URI: <http://hdl.handle.net/1811/35086>

Appears in Collections: [Ohio State Engineer: Volume 17, no. 2 \(November, 1933\)](#)

Engineering Review



Diesel Locomotive

A new 800 h.p. Diesel-electric locomotive, recently purchased by the Northampton and Bath, enables its commodity—transportation—to be produced in the most efficient and modern way possible. The new locomotive in a three-months' test, sponsored by operating officers of the N. & B. and representatives of the manufacturer, proved itself superior in many ways, and has now been adopted permanently to carry on the work of the Northampton and Bath Railroad.

The locomotive burns a very low cost fuel—Diesel oil—which is practically the same as furnace oil used in the home. The total cost of fuel is only \$4.00 for an average day's work. This is remarkable considering that it is not unusual for a steam locomotive to burn \$15.00 to \$20.00 worth of coal to do the same work.

The new locomotive's appearance is much like that of a low coach or car with a raised center compartment. Two 400 horsepower internal combustion engines develop the power, electrical equipment transmits the power to the axles and the operator in the cab at the center controls everything. The center cab gives unobstructed visibility and being equipped with dual control provides simple, efficient and continuous operations in either direction and from either side of the cab.

There is nothing mysterious or unusually new about this Diesel-electric locomotive except that it combines the highly efficient Diesel engine with electrical equipment. The locomotive might be compared to the automobile. The Diesel engine does the same as the gasoline engine only it is many times larger and the electrical equipment takes the place of the gear box, clutch, drive shaft and differential which are not of adequate capacity to be used with the great power required on the locomotive. The engine develops power, a dynamo directly driven by the engine changes this power to electricity, cables carry the electricity to the trucks, and a motor on the truck converts the electricity back to mechanical power for driving the wheels.

—Westinghouse Technical Press.

Engineers' Registration

An act, passed by the Ohio State Legislature, and signed by Governor White, requires the licensing of all practicing engineers and surveyors in Ohio. The new law, which goes into effect January 1, 1934, creates a board of registration and requires all engineers and surveyors to register with this board. It makes it unlawful for the state or any of its political subdivisions to engage in the construction of any public work involving the practice of engineering or surveying unless plans have been made and construction supervised by licensed men of these professions. Projects that involve an expenditure of \$3000 or less are exempted from the terms of this act.

The law allows the licensing of all engineers and surveyors who have been practicing in Ohio for one year or more previous to January 1, 1934, immediately upon payment of the license fee, provided they register within eighteen months of that date. All other applicants must show proof of their respective abilities to practice.

The law also states that no person, who is not a licensed engineer or surveyor, shall practice these professions in Ohio, or to use in connection with his name or otherwise assume, use, or advertise any title or description tending to convey the impression that he is a professional engineer or surveyor.

A roster of the licensed men will be filed with the Secretary of State of Ohio, with the clerks of court in all counties, and with the auditors of principal cities.

—Highway Topics.

Portable Cutting Machine

A portable cutting machine weighing but 43 pounds has been announced by The Linde Air Products Company, 30 East 42nd Street, New York, as an addition to its Oxweld line of apparatus. It is known as the Secator.

Essentially it consists of an Oxweld Type C-14-H blowpipe (especially designed for it) mounted on an electrically driven, air-cooled, dust-proof chassis. It is equipped with a direct drive and runs either on a 1½ inch angle-iron track, furnished with it, or on any relatively smooth plane. When operated on the track, it does straight-line cutting automatically. For cutting simple shapes it can be guided with a hand-grip. For automatic circle-cutting, a center and a radius rod are furnished. For convenience of control, the oxygen and acetylene valves are on the chassis rather than on the blowpipe. The blowpipe can be adjusted vertically and horizontally and also to cut bevels up to 45 degrees. Its cutting range is that of the C-14 blowpipe and the cuts are so clean and smooth that for many purposes machining is unnecessary.

World's Largest Valves

More than four million pounds of steel and special materials are required in the production of the world's largest valves at the East Pittsburgh Works of the Westinghouse Electric and Manufacturing Company and to ship them to the Boulder Dam will require about ninety railroad cars. A total of eight gates, two in each intake tower will control the flow of water to the power plant developing 1,835,000 horsepower. With the exception of the cast steel throat liner and the small deflection plates, each gate is fabricated entirely by arc welding from steel plate.

In accordance with the boiler code requirements for class two welding, eighty welders were trained for this job for which a special heavy coated welding rod was developed. Standard steel plate rolled, cut to size and welded from the thirty-two foot cylindrical gates and nose liners. Because of the size and the accuracy required, the welding and machining presented many unusual problems. Due to the carefulness with which the mammoth gates were fabricated, every piece fit into place with precision and a water tight seal was secured in the test assembly at the shops.

In the construction of the gates, over 4,600,000 pounds of materials were used, including steel plate, steel castings, bronze, copper, stainless steel and monel metal. More than one mile of welding is used in the fabrication of one gate. Each gate assembly consists of a throat liner, a cylindrical valve, a nose liner, valve guides and minor fittings.

The monel metal seats making the water tight seal between the gate valve and the throat and nose liners are very carefully machined, 110,000 pounds being used for that purpose. Adjusting screws are provided for obtaining a perfect seal and locking into position on the upper seat only of each gate.

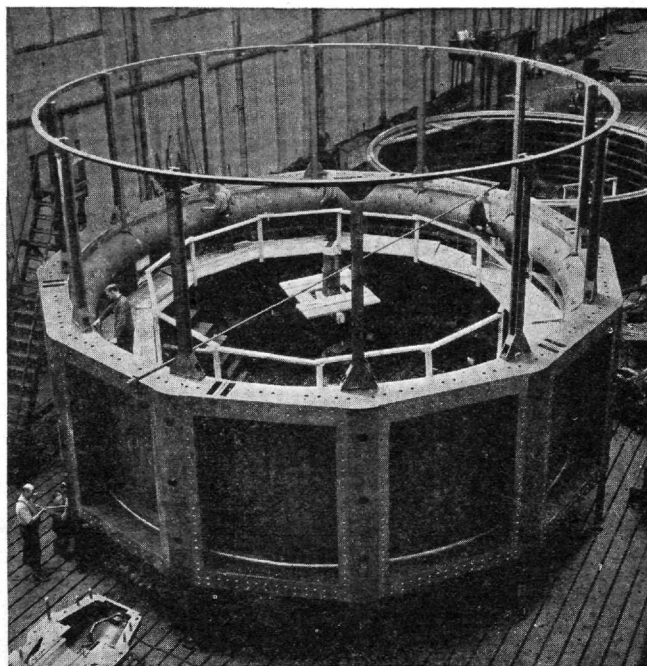
The cylindrical gate valves weigh 240,300 pounds and are formed entirely from steel plates cold rolled and welded. Each is made in six segments. Seven stiffening ribs, cold rolled from $2\frac{3}{4}$ " x $11\frac{1}{4}$ " stock on vertical rolls exerting a pressure of 575,000 pounds, are welded in position in each valve. To prevent water turbulence steel plates will be bolted over these ribs on the lower gates only. Also, specially cast steel deflection plates will be placed atop the lower gates to prevent turbulence and wear at the top seat.

New Type of Blasting Cap

A new all-metal delay electric blasting cap, revolutionary in design, is announced by Hercules Powder Company.

The outstanding features of the new detonators are the firing and delay elements that produce practically no gas when burning. These features make possible the use of a solid, one piece, ventless shell.

The new delay cap, having no hot gas, cannot cause ignition of the dynamite. Needing no gas-escape openings in the shell no moisture can enter, a usual cause of mis-



fires in other types of delays.

According to the manufacturer, the new type detonator represents the greatest advance in detonator construction since the invention of the electric blasting cap.

Hundreds of thousands of the new delays have been tested in the field with unvaryingly satisfactory results, according to Hercules explosives authorities. U. S. patents have been applied for on this new cap and are pending at this time.

"The Engineer"

(Copied from A.T.S. Review)

"Since the Lord made the earth in six days, engineers, although paid on the six-day basis, have continued to work seven days and nearly as many nights a week. An engineer can be identified by his trusting look, the resigned expression on his face, and a table of sines and cosines carried near his heart.

"Our government has had two famous engineers who gained fame by ceasing their chosen occupations and becoming Public Servants--George Washington and Herbert Hoover. An engineer with the temperament of a grand opera star is an inventor and can be recognized by long hair and flowing bow tie.

"There is only one engineer on record who has become rich. He recently died in Colorado and left a fortune of \$50,000 which he amassed through unceasing toil, superhuman perseverance, remarkable ingenuity and the death of an uncle who left him \$49,995.00.

"Engineering is a good deal like golf. Those who are good drivers become managing executives; for those whose best shots are brassie, the advertising profession offers a good opportunity in case of a good lie; those who approach well find salvation in salesmanship, and those good on the green become cashiers and investment brokers. The duffers remain engineers.—Anonymous.